SDDVR

H.264 MINI DVR

Installation & User's Manual

GENERAL SAFETY AND PRECAUTIONS

The SDDVR is manufactured to meet international safety standards. Read the following safety precautions to avoid injury and prevent damage to the SDDVR or any products connected to it.

1. Use a correct power source. Do not connect this product to a power source that supplies more than the specified voltage (DC12V), as this will cause damage to the unit.

2. Never insert anything metallic into the SDDVR as this can cause electric shock.

3. Do not operate in wet & dusty conditions. Keep product surfaces clean and dry. Avoid placing the SDDVR in areas like a damp basement or a dusty hallway.

4. Do not expose this product to rain or use near water. If the product gets wet, unplug it and contact an authorized dealer immediately.

5. To clean the outside case of the SDDVR, use a lightly dampened cloth (no solvents).

6. Do not operate if you suspected to unit is faulty. If there are any unusual sounds or smells coming from the SDDVR, immediately unplug it and contact an authorized dealer or service centre.
7. Do not attempt to remove the top cover.

8. Warning: Removing the SDDVR 's cover can cause an electrical shock.

9. Handle SDDVR carefully to avoid damaging the product. Dropping your SDDVR on any hard surface may cause the unit to malfunction. If the SDDVR does not work properly due to physical damage, contact an authorized dealer for repair or exchange.

10. The unit has a lithium battery preinstalled.
The standard lithium cell 3V battery located on the motherboard should be replaced if the time clock does not hold its time after the power is turned off.

Warning:
Unplug the SDDVR before replacing battery or you may be subjected to severe electrical shock. Properly dispose of old batteries.

Caution:
Risk of explosion if battery is replaced by an incorrect type. Do not discard lithium batteries into the trash can or into fire. Dispose in accordance with local waste regulations.

Information to user
The user's manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

TABLE OF CONTENTS

Chapter 1: Packing Contents	
CONTENTS IN THE PACKAGE	**5**
Chapter 2: Getting To Know Your SDDVR	
SDDVR	6
Chapter 3: Remote control	
REMOTE CONTROL PANEL	8
Chapter 4: Getting Started	
OVERVIEW OF SET UP PROCEDURES	10
Chapter 5: Hardware Installation	
SD MEMORY INSTALLATION	11
CONNECTING **SDDVR** TO YOUR TV SET OR MONITOR	11
ALARM INSTALLATION	13
Chapter 6: OSD MODE	
1. ACCESS TO OSD MENU	14
2. MAIN MENU	14
3. SYSTEM SETUP 3.1 TIME SET > DAY LIGHT SAVING 3.2 LANGUAGE SETUP 3.3 VIDEO OUTPUT 3.4 BRIGHTNESS:	15
4. VIDEO SETUP 4.1 RESOLUTION 4.2 VIDEO QUALITY 4.3 FRAME RATE 4.4 PRE RECORDING TIME 4.5 POST RECORDING TIME 4.6 AUDIO RECORDING 4.7 DISK OVERWRITE	16

5. EVENT SETUP 18
5.1 ALARM SETUP
5.1.1 ALARM INPUT
5.1.2 INPUT TYPE
5.1.3 ALARM OUTPUT
5.1.4 OUTPUT TYPE

5.2 MOTION DETECTION
5.2.1 SENSITIVIITY

5.3 SCHEDULE SETUP
5.3.1 TIME
5.3.2 TIME AND EVENT

6. SUB MENU 19
6.1 PASSWORD CHANGE
6.2 FILE INDEX RENEW

Chapter 7: SCREEN MODE

1. LIVE SCREEN MODE
1.1 SCREEN MESSAGE 20
1.2 SCREEN ICON

2. SEARCH MODE
2.1 SEARCH LIST
2.2 SEARCH FACTPR
2.2.1 SEARCH FACTOR – TIME
2.2.2 SEARCH FACTOR – EVENT 22
2.2.3 SEARCH FACTOR – BOTH
2.3 PLAYBACK SCREEN VIEW

Appendix:

TECHNICAL SPECIFICATIONS 24

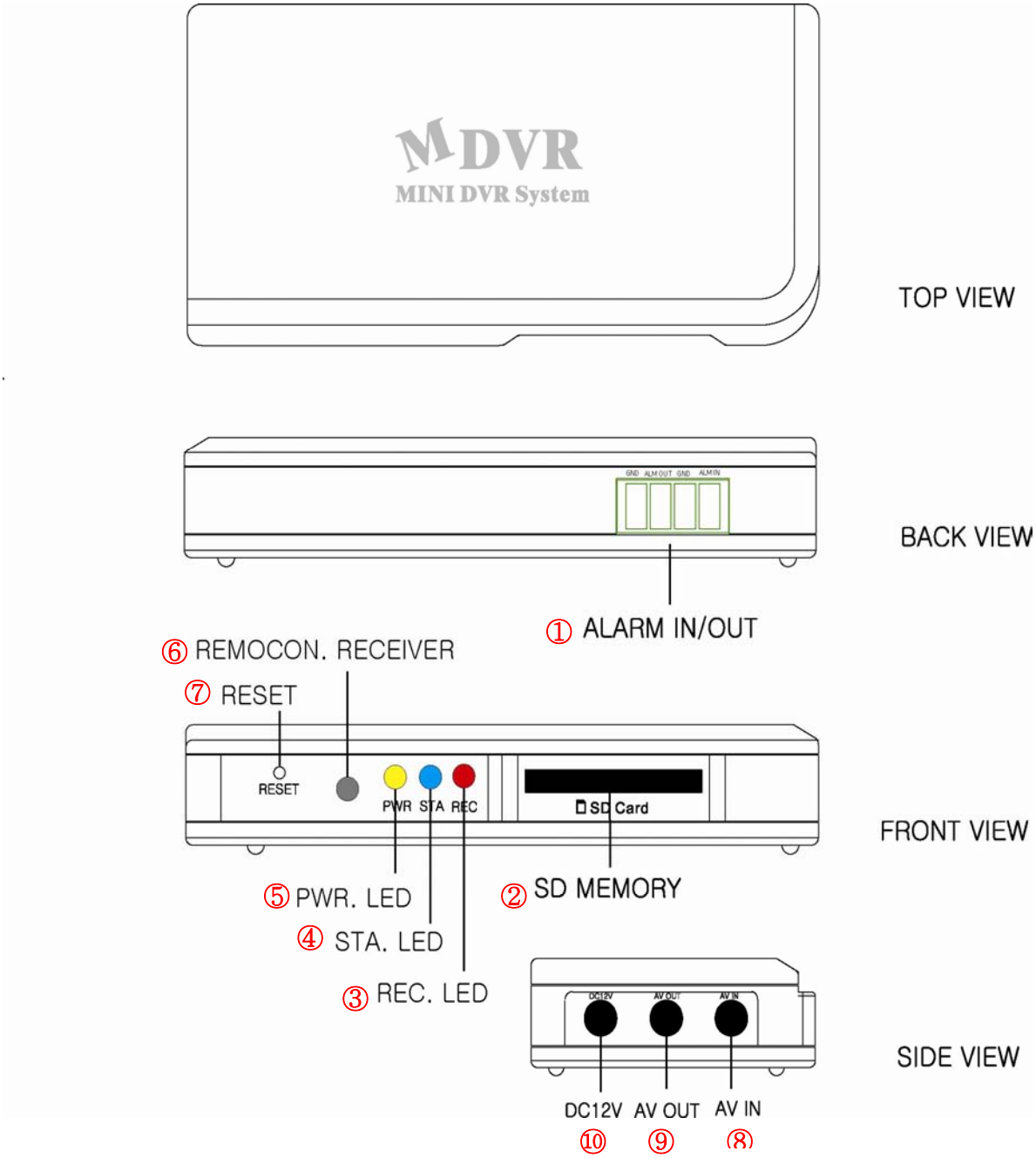
RECORDING TIME TABLE 26

Chapter 1: Packing Contents

▶ **Contents in the package**

SDDVR Main Unit	Remote Controller	AV-IN / AV-OUT Connector
Terminal Block	12V Power Supply	Installation CD

▸ SDDVR



This chapter briefly describes the functions of each button on SDDVR. The buttons are used to operate the basic functions of SDDVR, such as recording, playback, fast-forward, reverse play and etc. For more details on the set-up and operation of SDDVR, refer to Chapter 6, SDDVR MENU.

1	**Sensor-in / Alarm-out**
	The sensor terminal block is used to connect a sensor such as PIR to the SDDVR. If you add motion sensor devices to your SDDVR, the video recording can be triggered by event. The alarm output terminal is used to install a single alarm device.
2	**SD Memory Slot**
	Insert SD Card into the slot for storing data.
3	**Recording LED**
	This light indicates while SDDVR is on recording mode.
4	**Status LED**
	This light blinks when events occur or there is any error..
5	**Power LED**
	This light indicates the SDDVR is powered up.
6	**Remote control Receiver**
	When controlling SDDVR by remote control, be sure to point at the receiver.
7	**Reset**
	Press the reset button if you want to return setting values to the default.
8	**AV-IN**
	Connect AV-IN connector
9	**AV-OUT**
	Connect AV-OUT connector
10	**Power**
	Connect 12V power supply in the package.

Chapter 3: Remote control

1		**REC**	Start SDDVR recording or stops recording. Turn the SD power off when pressing the REC button for 3 seconds. (Recording can resume after 20 seconds)
2		**MENU**	Enter OSD menu. On OSD menu, go to the upper menu.
3		**UP/ DOWN**	On OSD menu, chooses menu fields and change values. On search mode, play the previous or next recorded file.
4		**LEFT/ RIGHT**	REW: Fast Rewind (X2-X4-X8-X16) FF: Fast Forward (X2-X4-X8-X16)
5		**REW**	REW: Fast Rewind (X2-X4-X8-X16)
6		**FF**	FF: Fast Forward (X2-X4-X8-X16)
7		**PLAY**	Playback at X1
8		**STOP**	Stop recording or playback. On playback mode, go back to the first frame.
9		**PAUSE**	Pause playback or resume playback.
10		**MUTE**	Remove audio.
11		**ENT**	On playback mode, playback at X1. On OSD menu, enter values.
12		**SEARCH**	Enter Search menu. On search menu, move to upper search menu.

13		MODE	Switch between playback mode and live view mode.

Remote Controller Functions of LIVE MODE and PLAY Remote PLABACK MODE

Function	LIVE		PLAY BACK			
	Stand-by	Recording	Stand-by	Play	Menu	Remark
RECORD	O	O	X	X	X	O: Available X: N/A
MENU	O	X	O	O	O	
SEARCH	O	X	O	O	X	
MODE	O	X	O	O	O	
UP	X	X	O	O	O	
DOWN	X	X	O	O	O	
REW	X	X	X	O	O	
FF	X	X	X	O	O	
ENTENT	X	X	O	O	O	
REW	X	X	X	O	O	
FF	X	X	X	O	O	
PLAY	X	X	O	O	O	
STOP	X	X	X	O	X	
PAUSE	X	X	X	O	X	
MUTE	X	X	X	O	X	

Chapter 4: Getting Started

OVERVIEW ON SET-UP PROCEDURES

Below is an overview of the SDDVR installation procedures, (A detailed explanation is found in Chapter 5 - Hardware Installation.)

(1) Insert a SD MEMORY.
(2) Connect SDDVR to a TV set or monitor.
(3) Connect camera to SDDVR
(4) Connect optional accessories (sensors or alarm).
(6) Connect the power.
(7) Turn the power on.
(8) Start TV Monitoring and recording.

General Operating Advice:

● Make sure that a SD Memory is inserted and one camera is properly connected.
(See Chapter 5 -Hardware Installation)

● The SD Memory Format setting must be set (Refer to Chapter 5 – SD Memory Installation for more information.) Otherwise, SDDVR may not recognize the SD Memory.

● The firmware used in SDDVR is compatible with your computer's operating system (i.e. Windows). Therefore, you can take the SD memory card from this SDDVR and install it in your computer to view recorded video. (Refer to the PC Viewer manual.)

● SDDVR offers you the flexibility to choose a recording frame rate (maximum rate: 30 frames per second). A faster frame rate provides more natural video images in recorded video files. However, it requires more SD Memory storage. You may reduce the frame rate (minimum rate: 1 frame per second) to fit longer recording sessions in consideration of your SD card capacity.

● If a camera is normally connected to SDDVR, it enters the default operational state: VIEW mode. In this mode, SDDVR does not record nor play the recorded stream. It just shows the current images from camera connected to SDDVR.

● The default values of SDDVR for recording are set up at 30 frames per second with normal video quality.
If you use 1GB SD Memory, SDDVR can record approximately for 2 hours in a row.

● There is an exception to entering the VIEW mode at start up. If the power is abnormally turned off while SDDVR is performing emergency recording (i.e. a power failure), it will enter recording mode automatically when you reboot SDDVR.

Refer to Chapter 5 - Hardware Installation for more information on installation procedures.

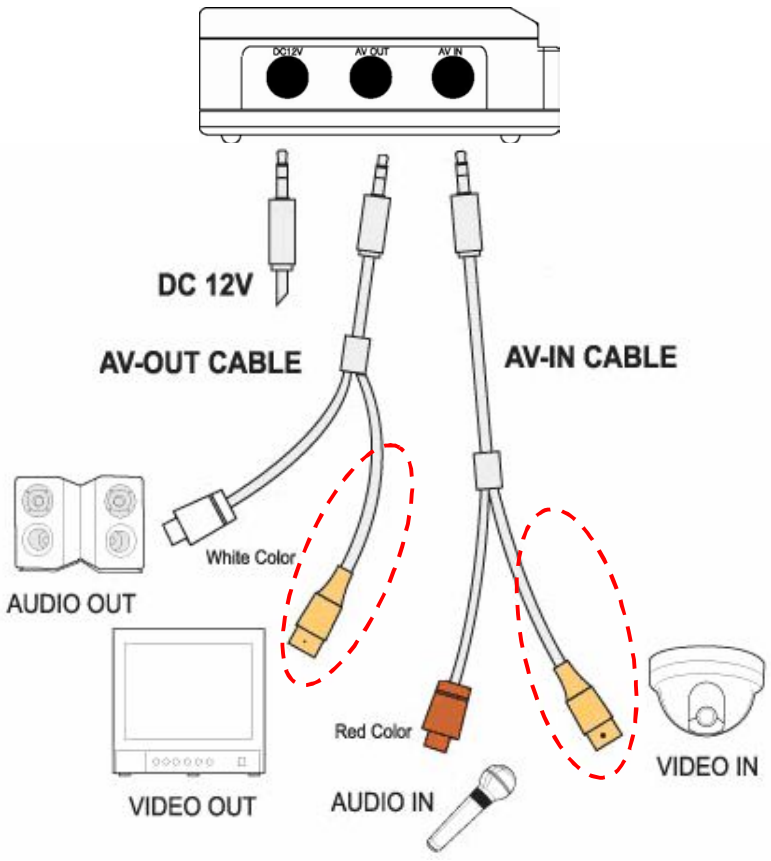
Chapter 5: Hardware Installation

SD MEMORY INSTALLATION

① Format SD Memory	Insert SD memory into SD card slot on your PC and format it in FAT32. ※ In case there is no card slot on your PC, use additional memory reader device.
② Insert SD Memory into SD slot on MDVR-200	After formatting, take SD Memory from your PC and insert it into SD slot on SDDVR.
③ Backup recorded files in SD Memory	When SD Memory storage is full, the recorded files can be backed up in your PC. Insert SD card in your PC and move the files of SD card into the HDD of our PC. You can also check each recorded file through AKR Player.

CONNECTING SDDVR TO YOUR TV SET OR MONITOR

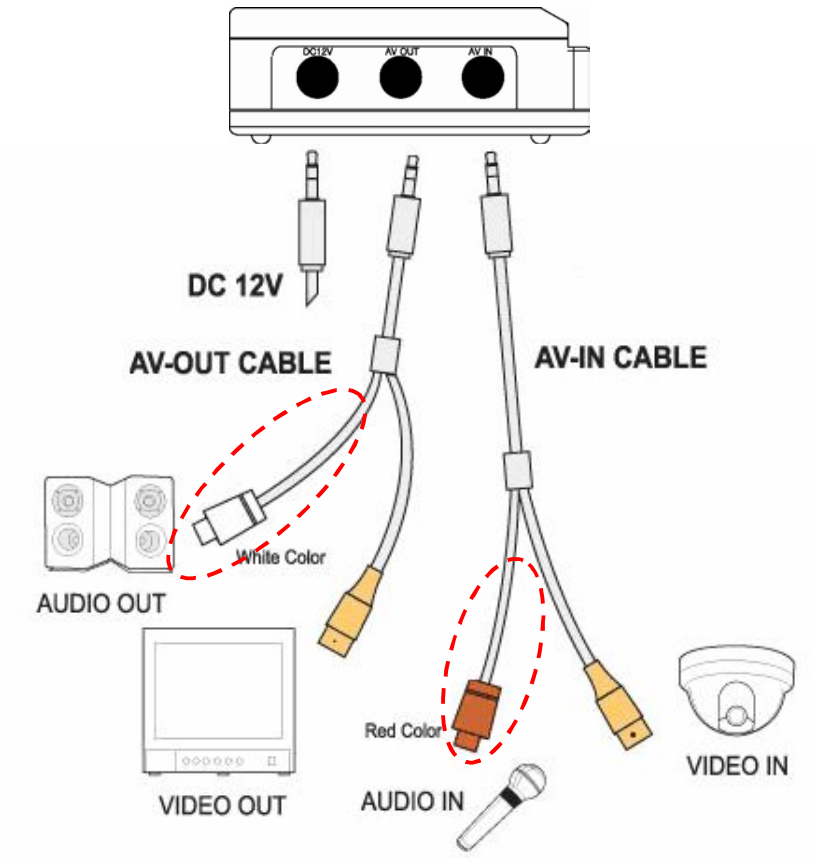
① Video Input/Output Connection (For TV / monitor screen display)



To display images from the SDDVR, connect the video output signal to your monitor or Television. Any Television with a VIDEO INPUT terminal is suitable for displaying the images. The diagram above shows the video signal connections.
Connect the camera to VIDEO-IN terminal of AV-IN connector; connect the monitor to VIDEO OUT terminal of AV-OUT connector.

Note: The RCA cable required for this connection is not supplied with the SDDVR.

② Audio Input/Output Connection (For TV / monitor speaker)



Connect the microphone to AUDIO-IN terminal of AV-IN connector; connect the speaker to AUDIO OUT terminal of AV-OUT connector.

Note: The RCA cable required for this connection is not supplied with the SDDVR.

※ SanDisk SD cards have been tested and proved to be compatible with MDVR-200. The compatibility with other brands is not guaranteed.

Recommended SD Cards:

- SanDisk
- SDHC: Sandisk 4GB/ 8GB/16GB

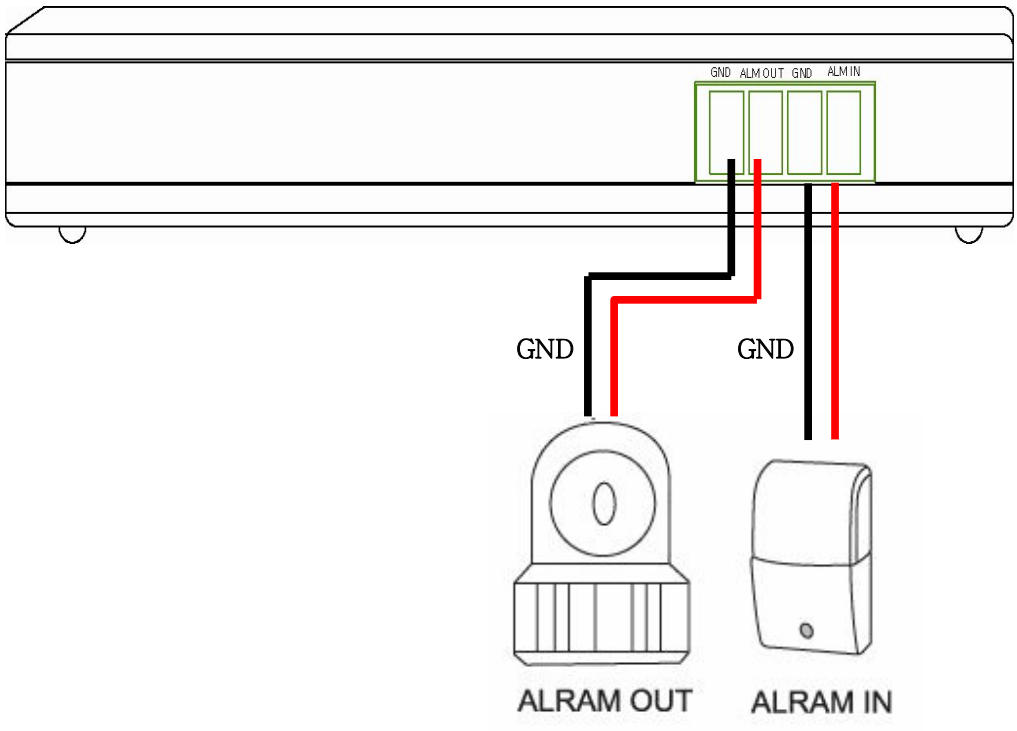
⚠ Attention
Do not take out the SD card or turn off SDDVR while it is in record mode. It may damage SD card.
When in record mode, turn off SD power by first pressing recording button for 3 seconds and then take the SD card out.

ALARM INSTALLATION

The SDDVR has an internal switch for sounding an alarm. When a sensor is triggered, the alarm is activated as well.

There are two steps to install an alarm.
1. Connect the alarm power lines to the alarm switch terminal.
2. Connect the alarm power lines to the appropriate power source.

Refer to the diagram below for information on how to connect an alarm to your SDDVR.



Note: Contact an authorized dealer for information about buying the appropriate alarm device for your needs and for information concerning proper installation procedures.

Chapter 6: OSD MODE

1. ACCESS TO OSD MENU

Press 'MENU' button on remote control to access to SDDVR OSD menu.
Please refer to 'Chapter 3: Remote control' about how to use remote control buttons.

Password is '0000' as default. The password can be changed on '[SUB MENU]→[PASSWORD CHANGE]'.
In order to select cameras for recording, set recoding quality, schedule recording times and to set other operation parameters, you will need to access the SDDVR (micro-D) menu.
Numerals can be selected by pushing up/down button on remote control.

2. MAIN MENU

In the main menu, the 'indicator '**>**' will be shown on the left of each menu.
Press 'UP/DOWN' button on remote control to select a desired menu. When '**>**' is indicated on the desired menu press 'ENTER' button to enter the menu.

3. SYSTEM SETUP

Configure current time and 'DAY LIGHT SAVING' option. On setting the current time, the field order should be as follows;
2004/02/17 = year/month/day 19:44:32 = hour/minute/second

3.1 TIME SET > DAY LIGHT SAVING
SELECT 'ON', when you want to use day light saving time. You can set up a time of period when day light saving is applied.

3.2 LANGUAGE SETUP
English, French, Dutch, German, Spanish

3.3 VIDEO OUTPUT
Not selectable. Display NTSC or PAL according to unit's CCD type.

3.4 BRIGHTNESS:
Select brightness value among low, medium and high.

4. VIDEO SETUP

4.1 RESOLUTION

Select video resolution (4CIF / 2CIF / CIF)

VIDEO INPUT (LIVE VIEW) Resolution - PAL

	HIGH	NORMAL	LOW
4CIF	704x576 / 25fps	704x576 / 25fps	704x576 / 25fps
2CIF	704x288 / 25fps	704x288 / 25fps	704x288 / 25fps
CIF	352x288 / 25fps	352x288 / 25fps	352x288 / 25fps

VIDEO INPUT (LIVE VIEW) Resolution - NTSC

	HIGH	NORMAL	LOW
4CIF	704x480 / 30fps	704x480 / 30fps	704x480 / 30fps
2CIF	704x240 / 30fps	704x240 / 30fps	704x240 / 30fps
CIF	352x240 / 30fps	352x240 / 30fps	352x240 / 30fps

PLAY VIEW Resolution - PAL

	HIGH	NORMAL	LOW
4CIF	704x576	704x576	704x576
2CIF	704x576	704x576	704x576
CIF	704x576	704x576	704x576

PLAY VIEW Resolution - NTSC

	HIGH	NORMAL	LOW
4CIF	704x480	704x480	704x480
2CIF	704x480	704x480	704x480
CIF	704x480	704x480	704x480

4.2 VIDEO QUALITY

LEVEL (HIGH / NORMAL / LOW): Select desired video level from 'LOW' to 'HIGH'.

MODE	HIGH	NORMAL	LOW
QUALITY(4CIF)	1500kbps	1000kbps	500kbps
QUALITY(2CIF)	1200kbps	800kbps	400kbps
QUALITY(CIF)	1000kbps	600kbps	300kbps

4.3 FRAME RATE

PAL: Selectable among 25, 12, 8, 6, 5, 1
NTSC: Selectable among 30, 15, 10, 6, 3, 1

4.4 PRE RECORDING TIME

MODE	HIGH		NORMAL		LOW	
	Bit Rate (kbps)	Pre Recording Time	Bit Rate (kbps)	Pre Recording Time	Bit Rate (kbps)	Pre Recording Time
4CIF	1500	10sec	1000	15 sec	500	20 sec
2CIF	1200	20 sec	800	25 sec	400	30 sec
CIF	1000	30 sec	600	35 sec	300	40 sec

4.5 POST RECORDING TIME

Post-recording time means the recording time between the beginning and end of an event.
(Min. 5 sec)

4.6 AUDIO RECORDING:

Audio function can be turned OFF or ON on the menu.

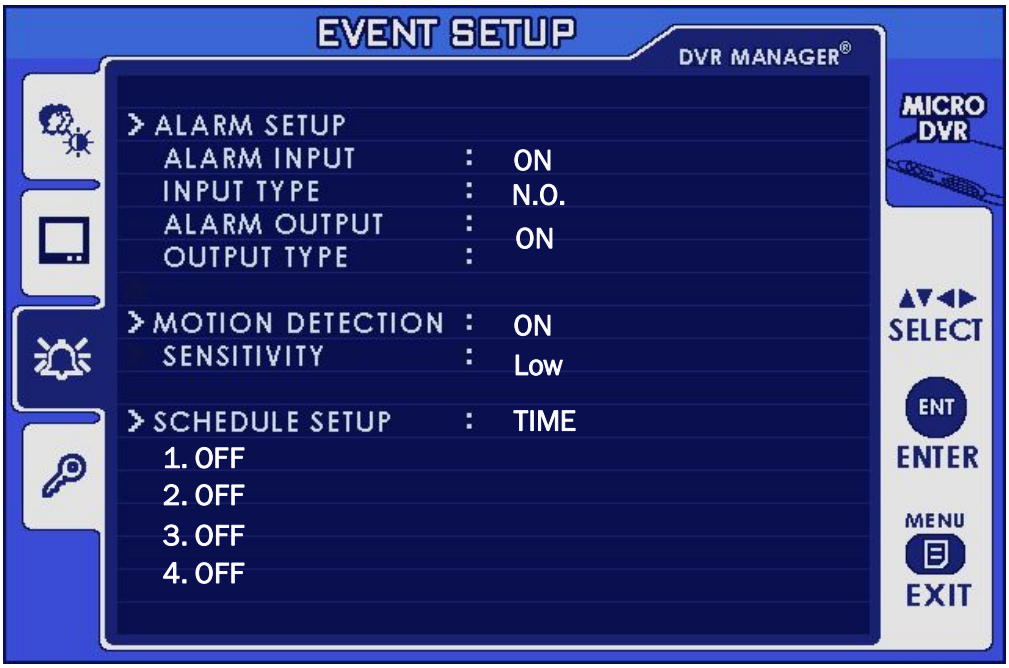
Note: *When recording audio, set the RECORD FRAMERATE to 5 or greater. If you set it under 5, audio recording will not work.*

4.7 DISK OVERWRITE

If overwrite is set to ON, the SDDVR will continue recording while automatically overwriting the oldest recorded files when SD memory storage capacity is full. Set to OFF, the recording will stop when the SD Memory is full.

4.7.1. DISK FULL WARNING: Select 'YES' if you want to display 'DISK FULL WARNING' when the SD card is full.
4.7.2. REMAINING TIME: This shows remaining time for further recording.

5. EVENT SETUP



5.1 ALARM SETUP

5.1.1 ALARM INPUT (ON / OFF): Select 'ON' if you want to use alarm input device.

5.1.2 INPUT TYPE: Select alarm input type between 'Normally Open' and 'Normally Closed'
NC: NORMAL CLOSE
NO: NORMAL OPEN

5.1.3 ALARM OUTPUT:

ALARM INPUT	ALARM OUTPUT	
Normally Open	**Normally Open**	Alarm input type is Normal Open. The device connected to alarm output is in 'OFF 'status and turns ON when events occur.
Normally Open	**Normally Closed**	Alarm input type is Normal Open. The device connected to alarm output is in 'ON 'status and turns OFF when events occur.
Normally Closed	**Normally Open**	Alarm input type is Normal Close. The device connected to alarm output is in 'OFF 'status and turns ON when events occur.
Normally Closed	**Normally Closed**	Alarm input type is Normal Close. The device connected to alarm output is in 'ON 'status and turns OFF when events occur.

Note: In NORMAL-CLOSE mode, if an intruder cuts the cable line that connects the sensor to the SDDVR, sensor recording starts automatically. In NORMAL-OPEN mode, if an intruder cuts the cable line that connects the sensor to the SDDVR, the sensor recording will not start at.

5.2 MOTION DETECTION

5.2.1 SENSITIVIITY (LOW / NORMAL / HIGH): You can select the degree of sensitivity of motion detection. Set to HIGH for greater sensitivity to small movements.

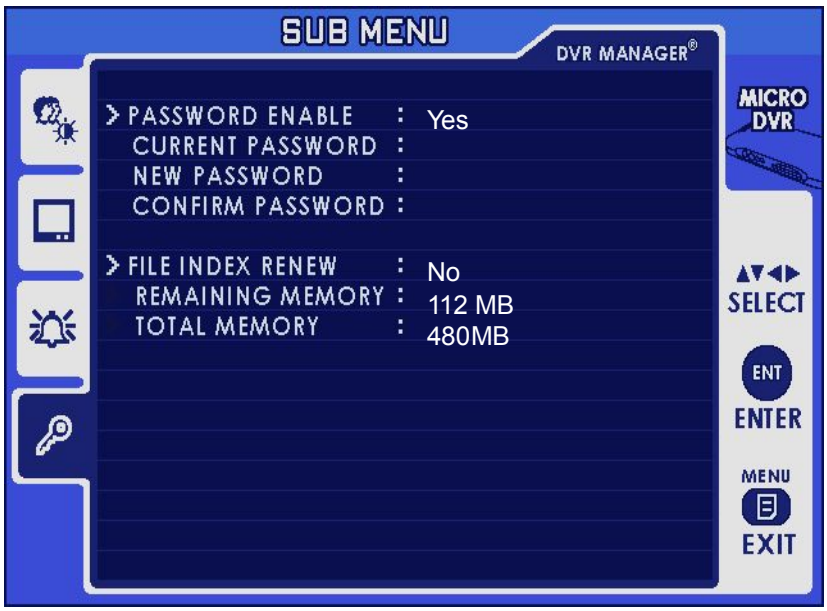
5.3 SCHEDULE SETUP

Make schedule for the recording time. Up to 4 schedules can be set.

5.3.1 TIME: Start to record when scheduled recording time is up.
5.3.2 TIME & EVENT: to record when motion is detected or an alarm occurs within scheduled period.

6. SUB MENU

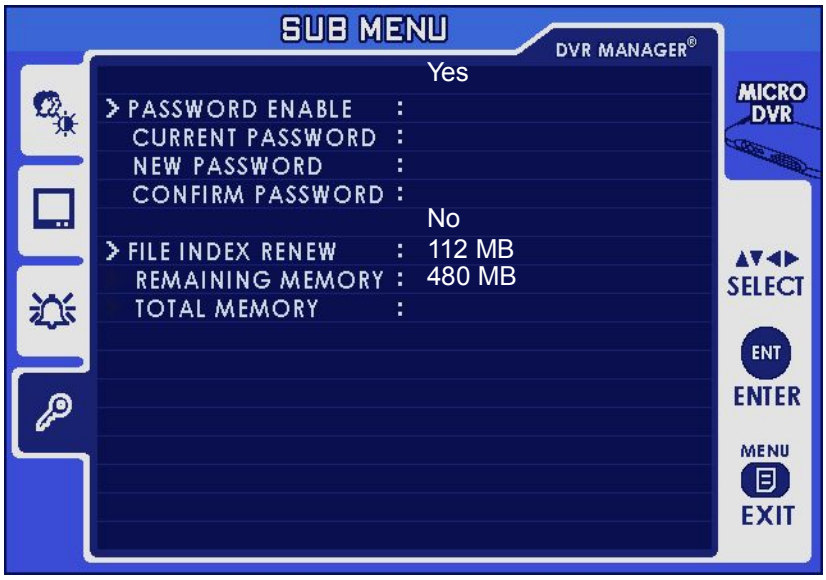
6.1 PASSWORD CHANGE



The Factory Default Password is 0000. To enter this number, press the UP/DOWN button on the remote control. Once you input the current password, set a new four digit password using the buttons UP, REW, DOWN, FF on the remote control. Then, confirm your new password by entering the number again. *

PASSWORD ENABLE : 'NO'
Select 'NO', if you want to enter the OSD MENU without Password.

6.2 FILE INDEX RENEW



The index file is automatically generated and stored in the SD card when inserted into SDDVR. If the index file does not match the files actually stored in the SD card, users can synchronize the index file list and the actual file list. While synchronizing, the process percentage is displayed; on completion the value returns to 'NO'.

Chapter 7: SCREEN MODE

1. LIVE SCREEN MODE

In live screen mode, 'time & date' information, screen message and screen icons are shown on the screen.

1.1. SCREEN MESSAGE

Message	Description
INITIALIZING…	Displays when the SDDVR is first booted.
WAIT…	Displays when playback and live modes are switched or when the screen mode and OSD menu are switched.
FILE NOT FOUND	Displays when there is no recorded files in the SD or no search result on search mode.
SD CARD ERROR	Displays when the SD card is physically damaged or recorded files in the SD CARD are damaged.
NO SIGNAL	Displays when there is no video input.
SD CARD LOCKED	Displays when SD CARD is locked or has an error.
INSERT SD CARD!	Displays when there is no SD CARD in the slot.
SD CARD FULL!	Displays when SD CARD is full so that video files can not be recorded. (OVERWRITE OFF)
MEMORY ERROR	Displays when there is an error in SDDVR.

1.2. SCREEN ICON

	EMERGENCY	Displays when in emergency record mode.
	MOTION	Displays when in motion-triggered record mode.
	ALARM	Displays when in sensor-triggered record mode.
	TIME	Displays when in schedule record mode.
	FULL	Displays when empty space remains less than 5% of the total SD Card storage. (In case of 512MB SD, less than 100Mbyte) The icon disappears when 'disk full warning is set to 'OFF' on OSD menu.
	SYNC	Displays when the content of index file is not matched with recorded files actually stored in the SD. The icon disappears when 'memory synch' is performed on OSD menu.
	SEARCH	Displays when in search mode.

N.B. All Recording Indicators will show up first with red color very shortly and then turn into white.

RED INDICATOR : **Recording is processing but if you stop recording, No file is made and thus not saved.(the data is not enough to form a file)**

WHITE INDICATOR: **When the white indicator is displayed, it means the recorded file can be made, even if you stop recording.**

2. SEARCH MODE

When pressing **'**SEARCH' button, LOGIN window appears.
To Enter 'Search Mode', enter 4-digit password.

2.1 SEARCH LIST

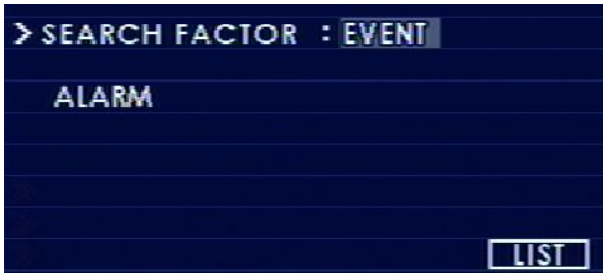
After pressing **'SEARCH'** button on remote control, click 'LIST'. The search results will be listed.

2.2 SEARCH FACTOR:

There are four ways to search recorded files; **TIME, EVENT, BOTH (TIME & EVENT), NONE**

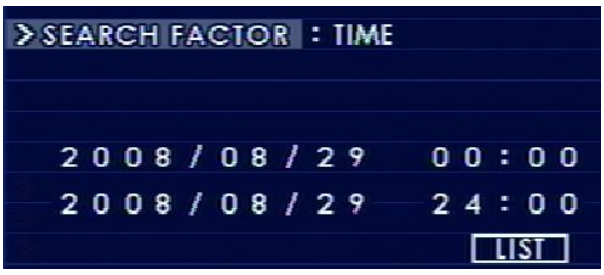
2.2.1 SEARCH FACTOR – EVENT:

When you select 'EVENT (or BOTH) on SEARCH MODE', subordinate search conditions open; ALARM / MOTION / EMERGENCY / TIME (Here, the time means "scheduled time recording" using scheduling feature) More than two conditions can be selected. In this case, each condition is connected with 'OR' condition.



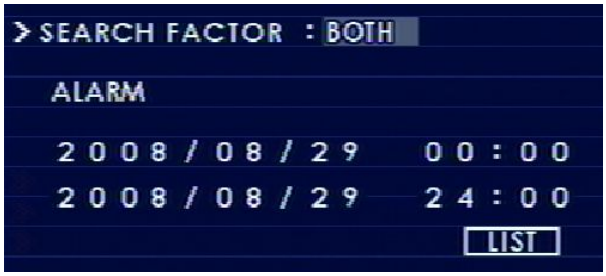
* **ALARM:** To search recorded files triggered by alarm-in event.
* **MOTION**: To search recorded files triggered by motion
* **EMERGENCY**: To search recorded files generated by emergency recording (full recording)
* **TIME** (scheduled time): To search recorded files generated by time schedule

2.2.2 SEARCH FACTOR – TIME:



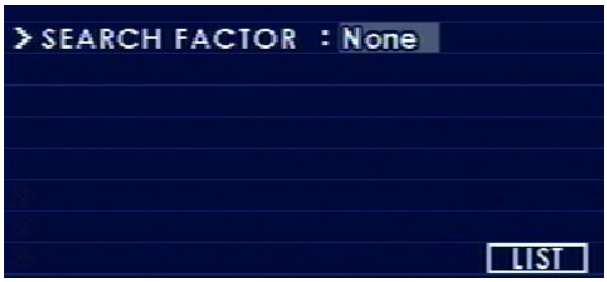
To search recorded all files within the specific period of time.
Enter the time period you wish to search for.

2.2.3 SEARCH FACTOR – BOTH:‘



When you select BOTH, search factors are combined in multiple conditions such as TIME and ALARM / TIME and MOTION /TIME and MOTION and EMERGENCY etc.

2.2.4 SEARCH FACTOR – NONE:



To search all the recorded files stored in the SD.card.

2.3 PLAYBACK SCREE VIEW

< Play Back Screen View >

APPENDIX

TECHNICAL SPECIFICATION

ITEM	DESCRIPTION			
VIDEO				
Encoding	H.264			
Input Channel	1 Ch.			
Input impedance	75 ohm Unbalanced			
Input Format	PAL/NTSC (Auto Detection), Composite, Auto detection function			
Maximum Input	1.0Vp-p @ 75 Ohm Unbalanced			
Output Channel	1 Ch.			
Output impedance	75 ohm Unbalanced			
Output Format	PAL/NTSC (according to Input), Composite			
Maximum Output	1.0Vp-p @ 75 Ohm Unbalanced			
RECORDING				
Video Recording Resolution				
	Format	PAL	NTSC	
	4CIF	704x576	704x480	
	2CIF	704x288	704x240	
	CIF	352x288	352x240	
Video Recording Quality / Pre-recording Time				
	Format	High	Normal	Low
	4CIF	1500Kbps	1000Kbps	500Kbps
	2CIF	1200Kbps	800Kbps	400Kbps
	CIF	1000Kbps	600Kbps	300Kbps
Video Recording Frame Rate				
	PAL	25, 12, 8, 6, 5, 1 fps		
	NTSC	30, 15, 10, 6, 3, 1 fps		
Recording Mode	Emergency / Schedule / Alarm / Motion Detection			
Decoding Video Format	As recorded Quality & Frame Rate			
Pre-recording Time	> 10sec(by Video Quality Setup)			
Storage	Support SD, SDHC (8GB max.)			
Storage File System	FAT32 (recommended) FAT16			
Maximum Recording File	2,000 files /Storage Device			
AUDIO				
Compression Format	16bit PCM, 8KHz			
Input Channel	1 Ch. Mono			
Input impedance	> 4.7Kohm, Unbalanced			
Maximum Input	6 mVp-p @600ohm			
Output Channel	1 Ch. Mono			
Maximum Output	13mW@RL =16ohm, Unbalanced			

Alarm	
Input	1 Ch. TTL(Internal full-up)
Output	1 Ch. TTL(Open collector)
OPERATING MODE	
Searching Method	Time/Event
Operating Mode	Live/Playback/Menu
VIEWER SOFTWARE	
Monitoring Environment	Client S/W
Connection	Supporting 1 Client
I/O	
A/Video Input	1Port, Female Stereo Phone Jack(include Jack Conversion Cable)
A/Video Output	1Port, Female Stereo Phone Jack(include Jack Conversion Cable)
Alarm I/O	1Port, Pluggable Terminal Block(include Plug)
SD Slot	1Port, SD Card Slot
DC Power Input	1Port, DC Power Jack
OTHERS	
LED	3 Status LED
Storage	Support SD, SDHC (16GB max.)
POWER	
Power consumption	Approx. 150mA @ 12VDC
ENVIRONMENTAL	
Storage Temperature.	-20 ~ +70°C
Operating Temperature.	-20 ~ +60 °C
Humidity	30 ~ 80 %RH (non-condensing)
PHYSICAL	
Dimension	92 (W) x 46 (L) x 18 (H) mm
Weight	Approx. 50g
ACCESSORY	
Remote Control	Supplied
A/V Input Jack /BNC Cable	Supplied
A/V Output Jack /BNC Cable	Supplied
AC/DC Adapter	Supplied
1GB SD Card	Optional

Approximate Recording Time Table

4CIF (704x480 / D1) Recoding Time (NTSC/PAL): SANDISK – SD/SDHC MEMORY

Memory	Usable Memory	HIGH / 4CIF / 25fps	NORMAL / 4CIF /25fps	LOW / 4CIF / 25fps
512 MB	480 MB	33 min	47min	1hr 26min
1 GB	960 MB	1 hr 9 min	1hr 40min	3hr
2 GB	1.9 GB	2hr 22min	3hr 26min	6hr 10min
4 GB	3.8 GB	4hr 49min	6hr 57min	12hr 44min
8 GB	7.4 GB	9hr 32min	13hr 46min	24hr 44min
16 GB	14.9 GB	19hr 12min	27hr 42min	49hr 46min

2CIF (704x240) Recoding Time (NTSC/PAL): SANDISK – SD/SDHC MEMORY

Memory	Usable Memory	HIGH / 2CIF / 25fps	NORMAL / 2CIF / 25fps	LOW / 2CIF / 25fps
512 MB	480 MB	40 min	58 min	1hr 42 min
1 GB	960 MB	1hr 25 min	2hr 1 min	3hr 34 min
2 GB	1.9 GB	2hr 55 min	24hr 10 min	7hr 20 min
4 GB	3.8 GB	5hr 54 min	8hr 27 min	14hr 51 min
8GB	7.4 GB	11hr 42 min	16hr 44 min	29hr 25 min
16 GB	14.9 GB	23hr 32 min	33hr 41 min	59hr 12 min

CIF (352x240) Recoding Time (NTSC/PAL): SANDISK – SD/SDHC MEMORY

Memory	Usable Memory	HIGH /CIF / 25fps	NORMAL /CIF / 25fps	LOW / CIF/ 25fps
512 MB	480 MB	47 min	74 min	12hr 6 min
1 GB	960 MB	1hr 40 min	2hr 35 min	4hr 24 min
2 GB	1.9 GB	3hr 26 min	5hr 19 min	9hr 3 min
4 GB	3.8 GB	6hr 57 min	10hr 46 min	18hr 20 min
8 GB	7.4 GB	13hr 46 min	21hr 20 min	36hr 18 min
16 GB	14.9 GB	27hr 42 min	42hr 56 min	73hr 2 min

* Recording time can differ according to SD card kinds.